

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
12 April 2001 (12.04.2001)

PCT

(10) International Publication Number  
**WO 01/25336 A1**

(51) International Patent Classification<sup>7</sup>: **C09B 62/022**,  
D06P 3/00, 1/38, C09B 62/503, 62/443

(74) Agents: REED, T., David et al.; The Procter & Gamble Company, 5299 Spring Grove Avenue, Cincinnati, OH 45217-1087 (US).

(21) International Application Number: PCT/US00/26911

(22) International Filing Date:  
29 September 2000 (29.09.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
9923332.2 1 October 1999 (01.10.1999) GB

(71) Applicant (for all designated States except US): **THE PROCTER & GAMBLE COMPANY** [US/US]; One Procter & Gamble Plaza, Cincinnati, OH 45202 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **LEWIS, David, Malcolm** [GB/GB]; 13 St. Richards Road, Otley, West Yorkshire LS21 2AL (GB). **HE, Dong, Wei** [CN/GB]; 11 Tingley Common, Morley, Leeds, Yorkshire LS27 0HF (GB). **YOUSAF, Taher, Iqbal** [GB/GB]; 10 School Lane, Egham, Surrey TW20 9LQ (GB). **GENAIN, Gilles, Yves, Marie, Fernand** [FR/GB]; 7 Stamford Brook Avenue, London W6 0YB (GB).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, EE, ES, FI, FR, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:

— With international search report.

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: REACTIVE DYE COMPOUNDS

(57) Abstract: A reactive dye compound comprising: (a) at least one chromophore moiety; (b) at least one SO<sub>2</sub>C<sub>2</sub>H<sub>4</sub> group which is attached to the chromophore moiety either directly via the sulphur atom of the SO<sub>2</sub>C<sub>2</sub>H<sub>4</sub> group or via a linking group L; characterised in that at least one SO<sub>2</sub>C<sub>2</sub>H<sub>4</sub> group is substituted on its terminal carbon atom with at least one Y group wherein Y is a phosphonate or borate derivative. The compounds herein have high Exhaustion Values (E), high Fixation Values (F) and high Efficiency Values (T) and show significant improvements in terms of reducing spent dyestuff in effluent, increasing dye affinity to the substrate, increasing the dye-substrate covalent bonding, increasing the ability to dye substrates at room temperature, decreasing the amount of dye that is removed during the post dyeing "soaping off process" and therefore simplifying the post dyeing "soaping off process" traditionally associated with dyeing cotton with fibre reactive dyes and reduction of staining of adjacent white fabrics. In addition, the compounds prepared above provide more intense dyeings and require less levels of salt for dyeing cotton substrates.

WO 01/25336 A1